**●1380** HIGH FREQUENCY JET VENTILATION TREATMENT OF PULMONARY INTERSTITIAL EMPHYSEMA Thomas R. Harris and Robert D. Christensen, University of Utah School of Medicine and Primary Children's Medical Center.

Twenty-two neonates with pulmonary interstitial emphysema (PIE) unresponsive to conventional forms of treatment, were ventilated with a high frequency jet ventilator (HFJV). Sixteen of 22 developed PIE subsequent to severe hyaline membrane disease (HMD), 5 were in association with bacterial pneumonia-septicemia, and 1 was associated with meconium aspiration syndrome. All but 1 patient (septicemia) showed temporary or permanent resolution of the PIE; however only 11 (50%) survived. The 16 patients with HMD-associated PIE had the most favorable outcome. In that group, switching from intermittent mandatory ventilation (IMV) to HFJV resulted in a mean drop in PaCO2 from 60 mmHg (range 29-192) to 37 mmHg (range 13-53) while operating at an intratracheal mean airway pressure (MAP) of 3.1 cm H2O less (0.3-7.6) and a peak inspiratory pressure (PIP) of 9 cmH2O less (2-15) than on IMV. Of the 11 patients who died, 7 (64%) had pulmonary bacterial infection, either during life (n=3) or at postmortem (n=4). Factors significantly favoring survival included (1) lack of bacterial infection, (2) development of PIE after 48 hours of age, and (3) a drop of PaCO2 of over 30 mmHg on HFJV while maintaining a constant PaO2 using lower PIP and MAP than was required on IMV. We conclude that HFJV is effective in resolving PIE and improving survival in neonates with HMD-associated PIE.

**1381** USE OF THE VIDEOTAPE IN THE INTENSIVE CARE NURSERY. Doris K. Hiatt, Edwin Soto, Francoise Marotta, I.Mark Hiatt, Thomas Hegyi, UMDNJ-Rutgers Medical School, St. Peter's Med. Ctr., New Brunswick and Monmouth Med. Ctr., Long Branch, N. J.

Maternal adjustment to the birth and transport of a high risk infant can be facilitated by the use of videotape. Concerns about the infant's health, accompanied by anticipatory grieving, depression, and self deprecation reduce the mother's capacity to cope and to maintain emotional investment in her infant.

Seventeen mothers were randomized into a trial designed to assess the impact of videotaped visits. Nine study mothers viewed a videotaped miniprogram of their babies and the support team within 36 hrs. of transport, in addition to standard daily communication. Eight control mothers received only standard support. Prior to discharge, all mothers were evaluated by a questionnaire (Benfield, 1976) to assess anticipatory grief and affective and behavioral reactions following the baby's transport.

Results indicate significantly lower anticipatory grief scores ($P<0.05$) among the study group. All mothers reported that the tape helped them feel their baby was getting good care, and that the team understood their importance to the baby "to a great degree". Eight of 9 reported that the tape improved their outlook about the baby's future and their understanding of the infant's condition and special needs. Responses to open ended questions confirmed the positive quality of this experience. In our study population, the videotape improved communication between mother and staff and helped prepare her for her visit to the ICN.

**1382** BRAINSTEM AUDITORY EVOKED RESPONSES(BAER)IN PREMATURE INFANTS WITH SEVERE INTRAVENTRICULAR HEMORRHAGE (IVH). Jesse Mintz, I.Mark Hiatt, Thomas Hegyi, UMDNJ-Rutgers Medical School, St. Peter's Medical Center, Department of Pediatrics, New Brunswick, NJ.

Higher incidence of BAER abnormalities were found in a group of very low birthweight infants with severe IVH compared to a heavier group without IVH.

Nineteen infants (BW:1.2±0.3kg,GA:28±1 wk) with IVH and 42 (BW:2.3±1.2kg,GA:36±4wks) control infants were examined at postconceptual age ranging from 33 to 52 weeks. Monaural stimulation at 16 clicks per second and 70 decibel intensity was used and the presence, stability, and appearance of Waves I, III, and V were evaluated.

Six of 19 IVH (32%) and 1 of 42 control (2%) infants manifest BAER abnormalities. This difference was significant at the $p<0.02$ level. In the IVH group, 3 of 8 infants with ventricular dilatation (Grade 3) and 3 of 11 infants with intracerebral hemorrhage (Grade 4) had abnormal responses.

Seizures, asphyxia, and male sex significantly correlated with the presence of abnormal wave forms. However, these factors lost their significance when the analysis of variance was corrected for the presence of IVH.

In this group of infants, severe intraventricular hemorrhage is the most important etiology for the existence of brainstem dysfunction as measured by BAER.

**1383** ALVEOLAR PaCO2 AFTER ADMINISTRATION OF EXOGENOUS CO2 IN PRETERM INFANTS: ACHIEVEMENT OF STEADY STATE. Francoise Marotta, Maria Fort, I. Mark Hiatt, Thomas Hegyi, UMDNJ-Rutgers Medical School, St. Peter's Medical Center, Department of Pediatrics, New Brunswick, N. J.

Rapid achievement of steady state of alveolar PaCO2 was noted in a group of infants evaluated for ventilatory response to CO2. Ten infants,BW: 2.10±1.18kg and GA 33±6wks, were tested at a postconceptual age of 39±5wks. Ventilatory response was obtained by a computerized CO2 waveform analyzer that measures breath by breath alveolar CO2 concentration. Steady state was defined as equal values of PaCO2 for a 15 second interval that was usually comprised of 7 to 12 breaths.

After administration of 2% CO2 the time to steady state was 39±23 seconds (range 15-75 sec) and after 4% it was 39±15seconds (range 15-60 sec). Time to achieve steady state did not correlate with birthweight, gestational age or postconceptual age. In addition there was no correlation noted between the results obtained in 2% and 4% CO2.

Alveolar PaCO2 reaches a stable level quickly during CO2 response testing. Data can be safely collected after a lag time of approximately one minute.

**1384** THE EFFECT OF CAFFEINE ADMINISTRATION ON THE PNEUMOCARDIOGRAM IN HIGH RISK INFANTS. Francoise Marotta, Maria Fort, Ina L. Stile,I. Mark Hiatt, Thomas Hegyi,UMDNJ-Rutgers Medical School, St. Peter's Medical Center, Department of Pediatrics, New Brunswick, NJ.

Caffeine therapy improved the pneumocardiogram (PCG) score of five infants identified to be at risk for sudden infant death syndrome. The patients (BW 1.89±0.95kg, GA 33±7 wks) were initially evaluated with the PCG at 37±5wks postconceptual age.Oral caffeine citrate was then administered with a loading dose of 20 mg/kg followed by a daily maintenance dose of 5mg/kg. A second PCG was done at 39±5wks postconceptual age, approximately 1 week after the start of therapy. Serum caffeine levels at this time ranged from 6.5 to 14ug/ml. The results of the comparison are shown below:

| | PCG#1 | PCG#2 |
|---|---|---|
| Periodic Breathing (%) | 20.6±17.9 | 2.1±2.5 |
| Apnea 15 sec (total N) | 14 | 1 |
| HR 100 (total N) | 135 | 45 |

The PCG following caffeine therapy had significantly lower % PB, total apnea and total bradycardia events. Serum caffeine concentration did not correlate with any of the observed factors. No infant suffered any side effect of treatment. In this group of infants caffeine was effective in improving their performance on the pneumocardiogram.

**1385** THE EFFECT OF POSTNATAL AGE ON THE VENTILATORY RESPONSE TO CO2. Francoise Marotta, Maria Fort, I.Mark Hiatt, Thomas Hegyi, UMDNJ-Rutgers Medical School, St.Peter's Medical Ctr., Dept. of Pediatrics, New Brunswick, NJ

We studied the impact of postnatal age on baseline PCO2, slope, and position of the CO2 response curve in two groups of infants. Eight infants (Group I) with prolonged apnea (BW 1850±820g, GA 33±5wks) were tested twice at 42±7 and 55±9wks postconceptual age ($P<0.01$). Seven (Group II) near miss infants (BW 3160±760g, GA 37±3 wks) were examined at 48±6 and 68±6wks ($P<0.01$). Ventilatory responses to CO2 were obtained by a computerized CO2 waveform analyzer with the capacity to measure breath-to-breath responses.

| | Group I | | Group II | |
|---|---|---|---|---|
| | Test #1 | Test #2 | Test #1 | Test #2 |
| Baseline PCO2(mmHg) | 42±3 | 38±3 | 37±5 | 39±4 |
| Slope(mm/kg/min/mmHg BTPS) | 25.5±12.3 | 39.5±19.8 | 18.4±3.5 | 21.7±5.2 |
| PCO2 at Ve=300ml (mmHg) | 44±7 | 45±11 | 40±8 | 43±4 |

There were no significant differences in PCO2, slope and curve position at Ve=300ml between the two evaluations in either group. Due to the large coefficient of variation of the slope measurement we examined these results in another manner. In Group I, 5 slopes were abnormal (<20mm/kg/min/mmHg BTPS) in the first test and 3 in the second. In Group II 5 first slopes and 3 second slopes were abnormal. While this analysis suggests slope change with advancing age, the differences did not reach statistical significance. These data suggest that the CO2 response curve characteristics change little in the patients and time periods examined.